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CBCS SCHEME

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BAD402

Fourth Semester B.E./B.Tech. Degree Examination, June / July 2026
Artificial Intelligence

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Define Artificial Intelligence and explain the four approaches of AI with examples.	10	L2	CO1
	b.	Compare and evaluate Goal – based and Utility- based agents.	10	L3	CO1
		OR			
Q.2	a.	Define a Rational Agent and explain factors affecting rationality with example.	10	L2	CO1
	b.	Construct PEAS for an automated taxi driver system and explain each component.	10	L3	CO1
		Module – 2			
Q.3	a.	Define Problem – Solving Agents. Explain the " formulate – seach – execute" cycle with a neat diagram.	10	L2	CO2
	b.	Analyze the advantages and disadvantages of Iterative Deepening Search (IDS) over BFS and DFS.	10	L4	CO2
		OR			
Q.4	a.	Formulate the Vacuum Cleaner Problem as a search problem by defining states, actions, transition model, goal test, and path cost.	10	L3	CO2
	b.	Compare Breadth-First Search (BFS) and Depth – First Search (DFS) in terms of completeness, optimality, time complexity, and space complexity.	10	L4	CO2
		Module – 3			
Q.5	a.	Explain Greedy Best – First Search algorithm. Discuss the advantages and limitations.	10	L2	CO3
	b.	Apply the Greedy best first search to find the solution path from S to G. Write all steps as well as open and closed lists for full marks. S (h = 7) , A (h = 9), B (h = 4), C (h =5), D (h = 5), E (h = 3), G (h = 0).	10	L3	CO3

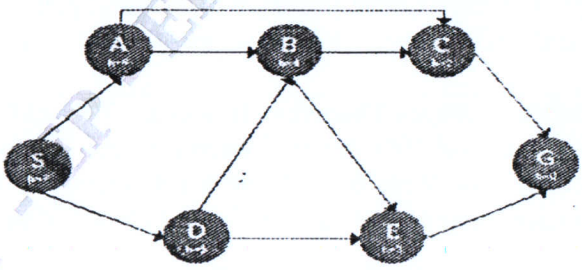

Fig. Q. 5 (b)

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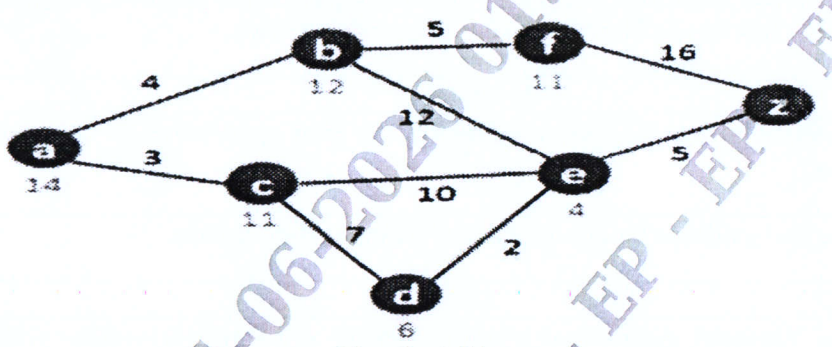
		OR			
Q.6	**a.**	Explain Wumpus World problem with PEAS description and environment properties.	**10**	**L2**	**CO3**
	b.	Apply the A* search to find the solution path from a to z, Heuristics are with nodes, and cost is with edges. Write all steps as well as open and closed lists for full marks.  Fig. Q. 6 (b)	**10**	**L3**	**CO3**
		Module – 4			
Q.7	**a.**	Differentiate between propositional logic and First – Order Logic in terms of ontological and epistemological commitments.	**10**	**L2**	**CO4**
	b.	Identify and represent the objects, relations, and functions in the following statements using First – Order Logic: i) "One plus two equals three" ii) "Squares neighboring the Wumpus are smelly" iii) "Evil King John ruled England in 1200"	**10**	**L3**	**CO4**
		OR			
Q.8	**a.**	Describe the structure of models in First – Order Logic and explain the role of interpretation.	**10**	**L2**	**CO5**
	b.	Construct First – Order Logic expressions using quantifiers for the following statements: i) All kings are persons ii) King John has a crown iii) Everyone loves someone iv) Someone is loved by everyone.	**10**	**L3**	**CO5**
		Module – 5			
Q.9	**a.**	Explain Backward Chaining algorithm with an example.	**10**	**L2**	**CO5**
	b.	Explain and derive Baye's Theorem and analyze its role in diagnostic reasoning with suitable examples.	**10**	**L3**	**CO5**
		OR			
Q.10	**a.**	Explain the concept of acting under uncertainty in intelligent agents and discuss why logical reasoning alone is insufficient in uncertain environments.	**10**	**L2**	**CO5**
	b.	Write the representation of Bayes Theorem. In a class, 70% children were fall sick due to Viral fever and 30% due to Bacterial fever. The probability of observing temperature for Viral is 0.78 and for Bacterial is 0.31. If a child develops high temperature, find the child's probability of having viral infection.	**10**	**L3**	**CO5**

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